

Risk assessment and intervention programs that target treated but uncontrolled hypertensives can be expected to yield substantial economic benefits in addition to preventing cardiovascular morbidity and mortality.

PCD2

ASSESSING THE BURDEN OF ILLNESS IN ELDERLY VERSUS YOUNGER ACUTE CORONARY SYNDROME PATIENTS

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OBJECTIVES: To compare the long-term clinical and economic outcomes of elderly (75 years) versus younger acute coronary syndrome patients. **METHODS:** We used the Duke Cardiovascular Databank to identify patients with a recent (<6 weeks) myocardial infarction or unstable angina, index cardiac cath between 1986 and 1997, significant coronary artery disease (CAD), and no previous cardiac procedures. Follow-up extended through 1998. We modeled clinical events (death, MI, coronary artery bypass graft surgery (CABG), percutaneous coronary intervention (PCI), and other rehospitalizations) to 12 years for pts with censored follow-up. We modeled inpatient and outpatient medical costs for all patients using inpatient costs from the GUSTO IIB clinical trial and other secondary data sources. **RESULTS:** Elderly (n = 1401) vs. younger (n = 8475) patients were more likely female (58% vs. 32%) and non-smokers (41% vs. 69%), had greater history of congestive heart failure (25% vs. 14%) and cerebral vascular disease (17% vs. 9%), less single vessel disease (30% vs. 46%) and more three vessel disease (43% vs. 26%), and greater 30-day mortality (9.8% vs. 3.2%). While median 12-year medical costs were greater for younger (\$57,475) than for elderly (\$53,431) patients, mean survival was less for elderly patients (6.4 vs. 9.3 years) yielding greater costs per year of survival (\$8075 vs. \$6037) for the elderly. **CONCLUSIONS:** CAD patients undergoing an initial cardiac cath after age 75 represent a high-risk group undetected by current CAD screening algorithms. These findings point to the need for improved screening tools and disease management strategies in high-risk, pre-CAD populations.

PCD3

INCIDENCE, UTILIZATION OF HEALTH CARE AND COSTS OF STROKE

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OBJECTIVES: Stroke is the third leading cause of death and a leading cause of disability. We determined inci-

dence, and total direct costs of stroke by stroke type, age group, gender and race. **METHODS:** We used an incidence approach and aggregate national data sources to determine 1998 US direct medical cost of stroke from a societal perspective. We modeled the disease from first hospitalization to end of first year. A sensitivity analysis varied prevalence and utilization of each cost factor around a base case. **RESULTS:** The incidence of first stroke is 232/100,000 population of which 82% are ischemic strokes. The total annual costs of a first time stroke are \$25.2 billion. The first hospitalization accounts for 20% of costs but all hospitalizations together in the first year account for the highest proportion of costs (65%, \$15.9 billion). Those with subarachnoid hemorrhagic stroke (\$18,461) had first hospitalization costs per stay more than three times higher than ischemic stroke (\$5,417) and more than two times higher than intracerebral hemorrhagic stroke (\$7,709). Also high are costs for chronic disability care, which are \$5.5 billion, primarily home care (\$3.9 billion). Sensitivity analysis showed a maximum variation in cost from \$15.8 to \$35.8 billion when varying incidence estimates. **CONCLUSION:** The societal cost burden is quite high and caused primarily by disability factors. Although ischemic stroke accounts for the highest total costs due to its higher incidence, subarachnoid hemorrhagic stroke accounts for more deaths and much higher first hospitalization costs. This study demonstrates a high combined acute and chronic care burden for stroke patients.

PCD4

THE IMPACT OF SECONDARY EVENTS ON THE COST OF ACUTE MYOCARDIAL INFARCTION

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OBJECTIVES: The importance of subsequent events on health care costs following acute myocardial infarction (AMI). **METHODS:** Patients with AMI (first admission = index) were identified from Massachusetts (MA) 1996/1997 patient-level discharge databases. Secondary events (i.e., AMI, angina, CABG, PTCA, coronary angiography, ischemic stroke, TIA, other related cardiovascular conditions) occurring within 12 months were assessed in terms of hospital costs, length of stay, discharge disposition and post-acute care costs. These data were supplemented by five additional state databases, fee schedules, other agency and survey data, and the literature. All costs are reported in 1998 US dollars adjusted for medical inflation and cost-to-charge ratios. Log transformation was used to address highly skewed distributions. **RESULTS:** Of the 8,037 MA AMI patients, 86% were discharged alive, and 54% of them were readmitted for another event, 49% more than once. Of those readmitted, 8.9% were hospitalized for a second AMI, 1.4% for a stroke. A second AMI increases the use of post-discharge formal health care services (e.g., skilled nursing facility, rehabilitation, home health care) by 19% and a stroke by 52%.

Managing a patient with a second AMI was 30% more costly (\$34,700 versus \$26,600 for single AMI). A stroke results in a 140% increase (\$63,836). Occurrence of any secondary event increases the first year management costs by approximately 36% (range: 4% for angina to 149% for CABG). **CONCLUSIONS:** To properly estimate the cost of AMI, the impact of secondary events needs to be considered. The increased economic burden resulting from these secondary events goes beyond the additional cost of another hospitalization. This information should be incorporated into economic models that address drug therapies for secondary prevention in AMI.

PCD5

COSTS OF LEFT VENTRICULAR ASSIST DEVICE VERSUS POSITIVE INOTROPIC THERAPY AS A BRIDGE TO HEART TRANSPLANT

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OBJECTIVES: Recent advances in left ventricular assist device (LVAD) technology have made this therapy a life-saving bridge to orthotopic heart transplant (OHT) in patients with heart failure who fail maximal medical therapy, including positive inotropic support. This study examined the costs of LVAD versus traditional intravenous positive inotropic support strategies in patients awaiting OHT. **METHODS:** To determine the economic impact of using either LVAD or positive inotropic support strategies for patients awaiting OHT, we retrospectively examined the itemized inpatient billing records of all patients who underwent OHT in 1993 (N = 18) and 1996 (N = 32) at our center. PreOHT costs (in 1997 US \$) were calculated for each billed item using institutional cost:charge ratios. Items were categorized as pharmacy, procedure, laboratory, bed, blood product, respiratory care, and supply. Professional fees were excluded from the analysis. Per diem costs were calculated to control for interpatient differences in length of stay. **RESULTS:** LVAD support was utilized in 10 patients, and the remaining 40 patients received only positive inotropic therapy prior to OHT. The groups were demographically and clinically similar. Pre-OHT length of stay was 113 ± 63 days vs 71 ± 46 days (LVAD vs positive inotrope groups; $P = 0.02$). Total pre-OHT per diem costs were $\$3651 \pm 1510$ for LVAD patients and $\$2625 \pm 602$ for positive inotrope patients ($P < 0.01$). Although per diem pharmacy and bed costs were similar, costs in the LVAD patients for procedures ($\$794 \pm 667$ vs $\$237 \pm 289$), laboratories ($\436 ± 280 vs $\$260 \pm 138$), blood products ($\122 ± 148 vs $\$12 \pm 16$), respiratory care ($\222 ± 263 vs $\$61 \pm 123$), and supplies ($\223 ± 131 vs $\$141 \pm 62$) were significantly higher than in positive inotrope-supported patients ($P < 0.01$ for all). **CONCLUSIONS:** In this study, length of stay and per diem costs were higher in patients requiring LVAD implantation as a bridge to transplant. These increased costs may

be justified given the extremely high mortality of these patients in the absence of LVAD support.

PCD6

COST ANALYSIS OF ANTIHYPERTENSIVE DRUG USE IN TURKEY

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The ministry of health is preparing a national rational drug consumption program in Turkey. It is a must to rationalize drug use and effectively reorganize reimbursement of drugs in order to minimize costs and maximize effective treatment. However, due to the lack of studies on drug prescription habits, rational drug prescribing and cost analysis, it is not possible to make effective changes. **OBJECTIVE:** We have conducted a pilot study on reimbursed prescriptions of Emekli Sandigi and Bag-Kur from January 1998-between September 1999 and evaluated antihypertensive drugs. **METHODS:** 2278 prescriptions from Ankara Numune Hospital and the social security systems (Emekli Sandigi, Bag-Kur) were chosen randomly. Medical information included the length of time medications were extracted. **RESULTS:** Cost analysis of antihypertensives showed that the average total cost of antihypertensive treatment was \$9.09 (range \$0.89–\$30.52) per patient and the most prescribed antihypertensive drug class was ACE inhibitors (25%). **CONCLUSIONS:** Taking the results of this pilot study into consideration, a master study for Turkey is planned which will also include postgraduate training programs to enhance rational prescription. In October 1999 the first program was held in Patalya Hotel-Ankara by the ministry of health.

PCD7

SOCIECONOMIC EVALUATION OF CILOSTAZOL FOR THE SECONDARY PREVENTION OF CEREBRAL INFARCTION IN JAPAN

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The use of such anti-platelet agents as aspirin and ticlopidine have not been approved in Japan for use in the prevention of the recurrence of cerebrovascular diseases that include cerebral infarction. Cilostazol is an anti-platelet agent indicated for the treatment of ischemic symptoms, including ulcer, pain, and cold sensation in chronic arterial occlusion, but it also has been confirmed to be effective over placebo with respect to the prevention of cerebral infarction recurrences through a randomized, double-blind, placebo controlled, multi-center clinical trial (RCT). **OB-**